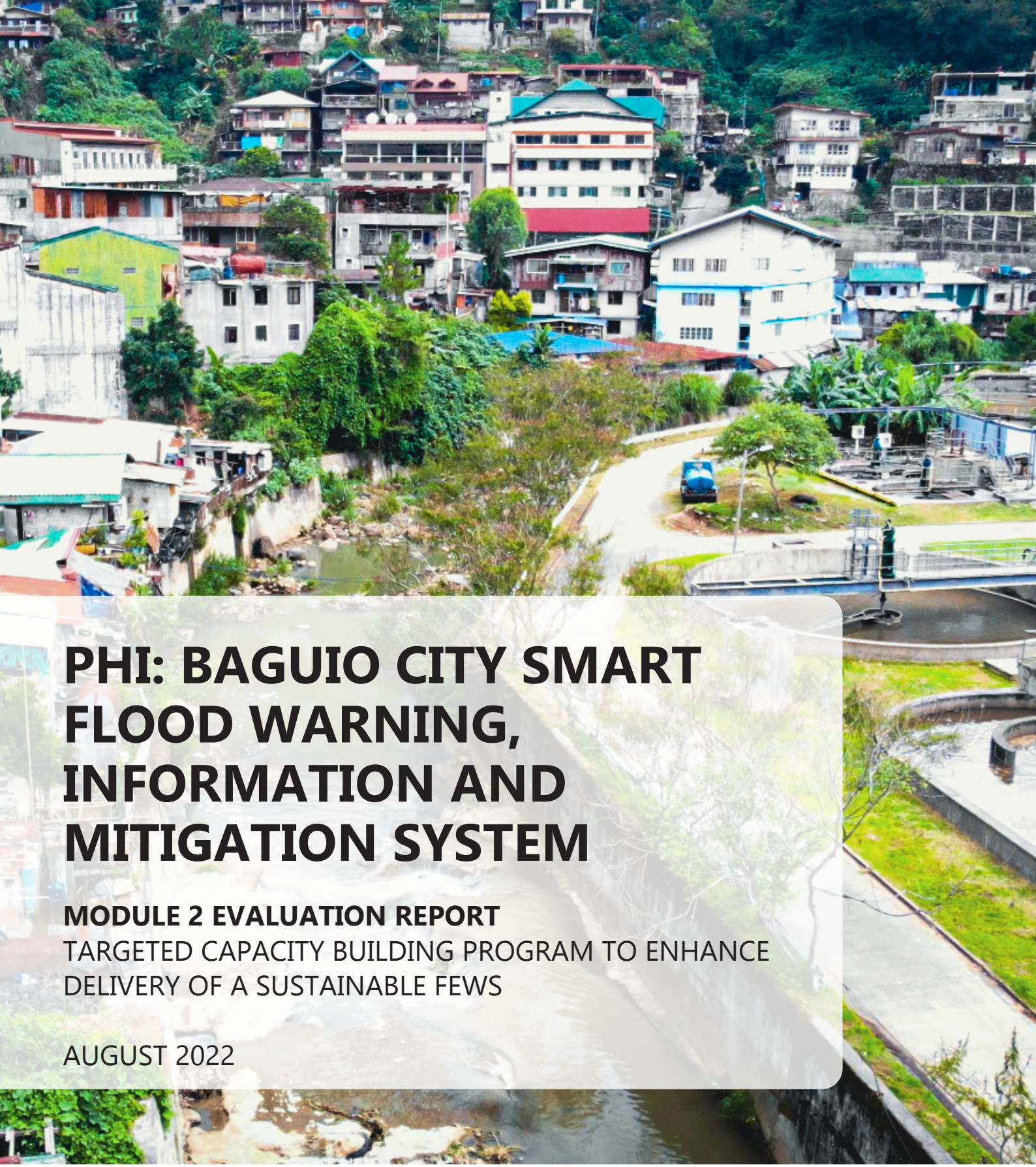

PHI: BAGUIO CITY SMART FLOOD WARNING, INFORMATION AND MITIGATION SYSTEM

MODULE 2 EVALUATION REPORT

TARGETED CAPACITY BUILDING PROGRAM TO ENHANCE DELIVERY OF A SUSTAINABLE FEWS

AUGUST 2022

ASEAN AUSTRALIA SMART CITIES TRUST FUND
Asian Development Bank

Australian Government
Department of Foreign Affairs and Trade

ADB

Source: AASCTF Team / Kristine Joy Lucero

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Cover image	Baguio CDRRMO

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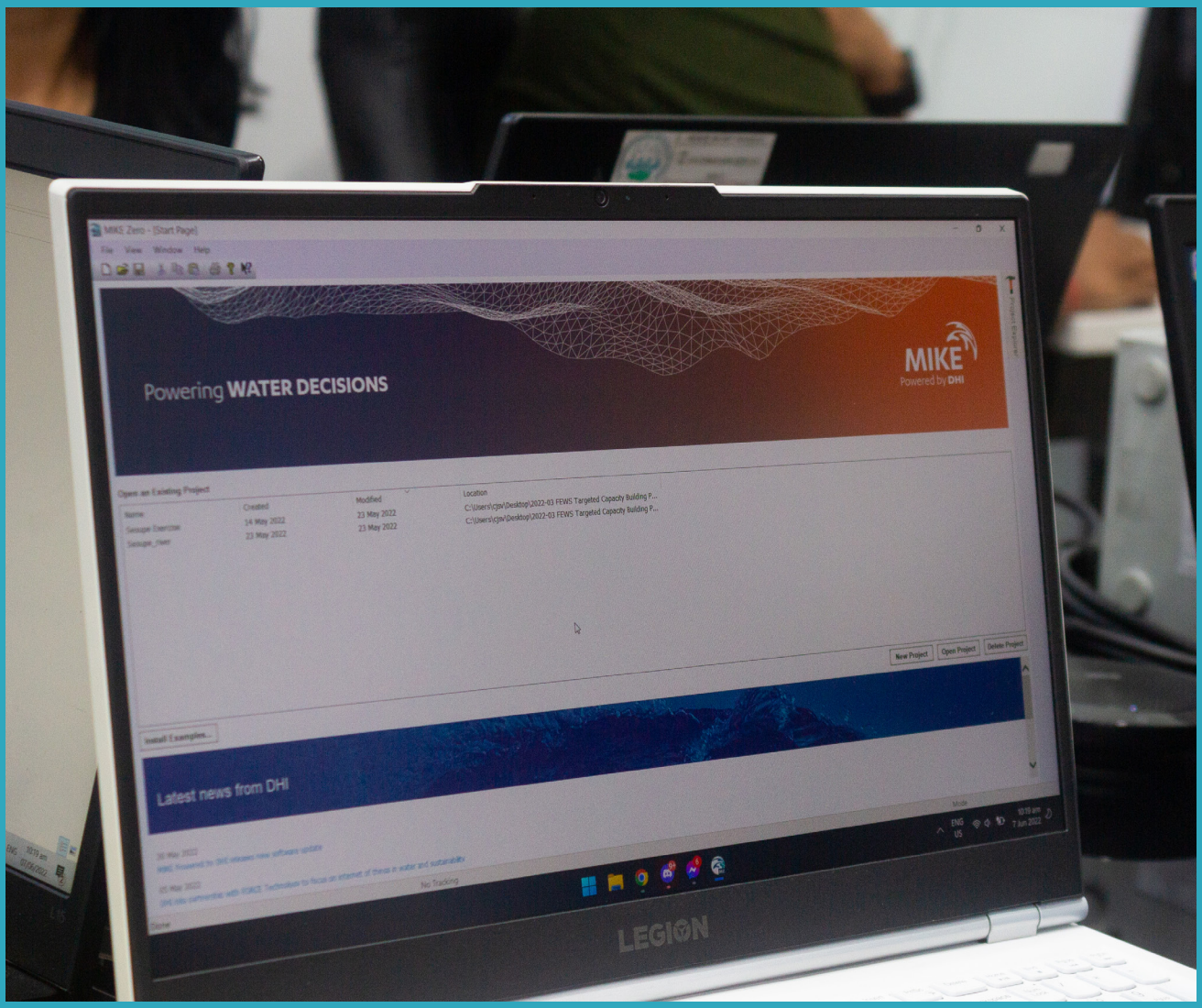
ABBREVIATIONS

AASCTF	ASEAN Australia Smart Cities Trust Fund
ADB	Asian Development Bank
BCDEO	Baguio City District Engineering Office
CBA	Cost Benefit Analysis
DEM	Digital elevation model
DFAT	Department of Foreign Affairs and Trade, Australia
DHI	Danish Hydraulic Institute
DOST-CAR	Department of Science and Technology in the Cordillera Administrative Region
FEWS	Flood Early Warning System
LGU	Local Government Unit (Baguio)
OTJ	On-the-Job (Training)
PAGASA	The Philippine Atmospheric, Geophysical and Astronomical Services Administration

Source: Baguio CDRRMO

1 BACKGROUND AND OBJECTIVE



Source: AASCTF/Kristine Lucero

1.1 BACKGROUND

In August 2020, the ASEAN Australia Smart Cities Trust Fund (AASCTF) Task Team (led by Ramboll) commenced work on the implementation of the "Baguio City Smart Flood Warning, Information and Mitigation System" pilot project. The development of the Flood Early Warning System (FEWS) under the pilot project is taking place in collaboration with Baguio Local Government Unit (LGU) and other key stakeholders to improve community disaster preparedness, raise awareness, and ensure local ownership. The FEWS is furthermore set to become an integral element within the overall vision of Baguio City to become a truly resilient, dynamic, and smart city.

The AASCTF was established in April 2019 as a single-donor trust fund supported by the Government of Australia, through its Department of Foreign Affairs and Trade (DFAT) and managed by the Asian Development Bank (ADB). The AASCTF aims to facilitate participating cities' transformation to becoming more liveable, resilient and inclusive, while in the process identifying scalable best and next practices to be replicated across cities in Asia and the Pacific.

1.2 TARGETED CAPACITY BUILDING PROGRAM

In an effort to further solidify and enhance program effectiveness and sustainability (beyond the completion of the pilot project in December 2022), an additional component, comprising a year-long "Targeted Capacity Building Program to Enhance Delivery of a Sustainable FEWS" was added, effective from end-December 2021.

The main objective of the targeted capacity building program is to garner increased confidence in the ability of the project intervention to foster long-term sustainability of the established FEWS by securing the required local capacity for operating and utilizing the FEWS as an active risk mitigation instrument beyond the timeframe of the pilot project.

The targeted training and capacity building program consists of the following key elements:

1. **3-module training program:** This component is led by DHI and supported by Ramboll. It focuses on giving the participants in the training program a **general understanding** of Flood Early Warning Systems and training in the different types of DHI software used in the specific FEWS being implemented under the "Baguio City Smart Flood Warning, Information and Mitigation System" pilot project. The training program is carried out as online (self-paced, instructor-led, and expert advice) modules based on the ACADEMY by DHI eLearning platform.[1]
2. **On-the-job (OTJ) training:** This is led by Ramboll and includes **specific hands-on training and support** related to the Baguio flood models and the specific FEWS developed by Ramboll in collaboration with the LGU.

A total of eleven (11) professionals have been selected to participate in the training and capacity building program following nomination from the LGU. Five (5) staff members from the LGU have been selected for participation in the program, and they will constitute the "core group," who will have the main responsibility for operation and maintenance of the FEWS. A "peer group" consisting of six (6) persons outside of the

[1] https://www.theacademybydhi.com/

LGU has also been selected for the program. The peer group participants come from local/regional public institutions which include 3 participants from 2 universities, 1 from The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), 1 from The Department of Science and Technology in Cordillera (DOST-CAR), 1 from the District Engineering Office (BCDEO), and their main role will be to support the core group.

Since the program kick-off and the completion of Module 1, one (1) participant from the peer-group (from University of the Cordilleras) has left the program due to added responsibilities and changed schedules and requirements in their current projects. Hence, ten (10) trainees are currently actively participating in the program.

1.3 THE 3-MODULE TRAINING PROGRAM

The structure and content of the 3-module training program is described in detail in the "Scoping and Training Course Design Report". The program consists of three modules, which are sub-divided into a total number of 10 sub-modules (cf. Figure 1.1). Module 1 (FEWS introduction and basic training), which was facilitated between 22 March and 29 April 2022, consisted of two instructor-led sub-modules (1a & 1b) and one self-paced course (1c). The evaluation of Module 1 is described in the "Module 1 Evaluation Report". This evaluation report covers the four sub-modules in Module 2 (Hydrological and Hydraulic Modelling), which were facilitated between 03 May 2022 and 14 June 2022.

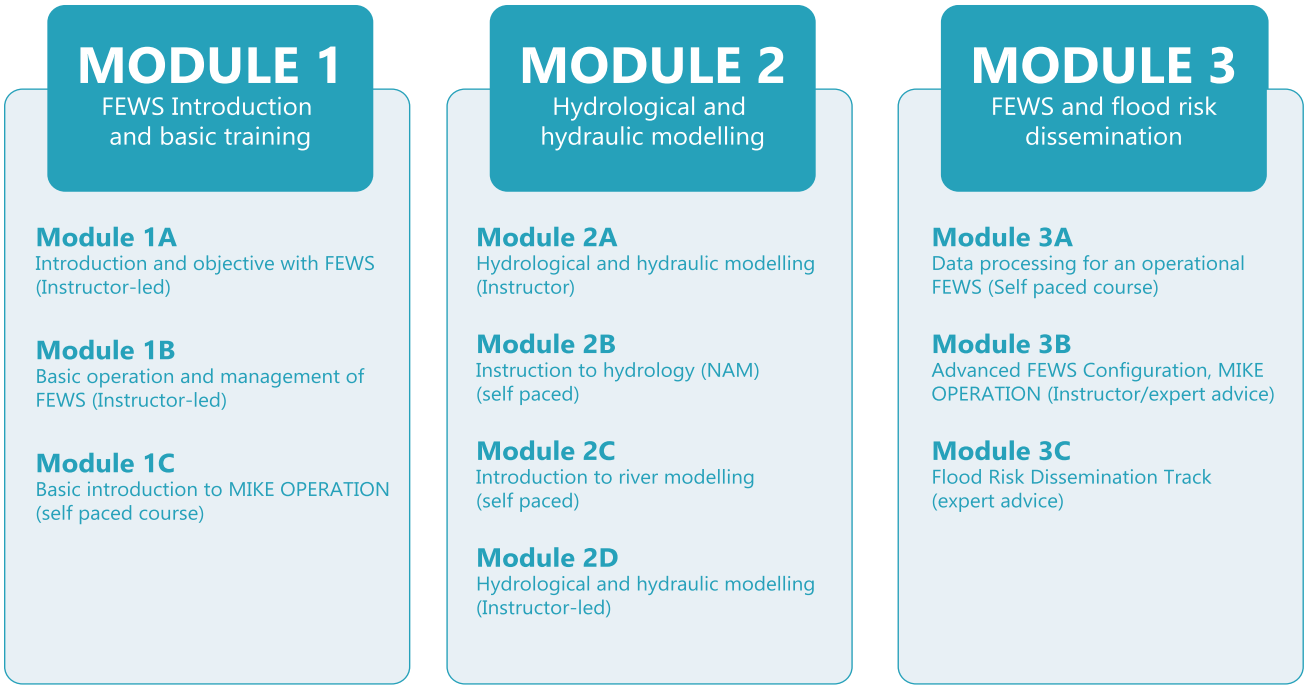


Figure 1.1 Illustration of the structure of the training program with three training modules and the underlying 10 sub-modules. Four of the sub-modules are self-paced, while the remaining sub-modules are instructor-led or based on expert advice.

All training materials have been made available through the ACADEMY by DHI eLearning Platform, which is described in further detail in the previous project reports noted above.

1.4 ASSESSMENT OF THE CAPACITY OF PARTICIPANTS PRIOR TO THE START OF THE TRAINING

Prior to the commencement of the training program, all eleven (11) participants were interviewed to garner a proper understanding of their educational and professional backgrounds, as well as existing skills and experience related to the training modules in order to tailor and adapt the program to the trainees' capacity.

The baseline assessment of selected participants' capacity is presented in the "Scoping and Training Course Design Report". The main conclusions from this report were listed in the previous Module 1 evaluation report. When evaluating the performance of the participants it is very important to keep in mind that **none of the LGU core group members have an educational background in hydrology, hydraulics and modelling,** and their knowledge in these areas was found to be none-existent or very limited prior to the start of the training program. They all have a BSc, but none of them with an educational background in water resources. Instead, two have a BSc in Nursing, two have a BSc in IT/Computer Science and one has a BSc in Civil Engineering.

1.5 COURSE MONITORING AND EVALUATION

To ensure that the content, the technical level, and the format of the training are suitable for the participants, the lead trainers of DHI and Ramboll are engaged in continuous dialogue with the participants to ensure that the training program meets their expectations and is continuously adapted to the wishes and suggestions from the participants. Accordingly, participant feedback is actively encouraged and addressed constructively in all training and knowledge exchange sessions through open dialogue and discussion.

For Module 2 participants were asked to complete a **Quiz** as part of the self-paced courses (sub-modules 2b & 2c). No quizzes were included in sub-modules 2a and 2d as they mainly consisted of an introduction and follow-up to the two (2b & 2c) self-paced courses and, as such, covered the same key concepts/topics.

For Module 1, evaluation surveys were conducted at the conclusion of each sub-module; accessible to the participants via the eLearning Platform. Through continuous feedback dialogue with participants, it was observed that the number of evaluation surveys and quizzes were overwhelming for participants. Thus, it was decided to adapt the sub-module evaluation to dialogue-based feedback.

Following the completion of Module 2, a **holistic evaluation survey** of the module was completed by participants. Furthermore, a Workshop (W3) was facilitated following Module 2 as part of the Midway Program Effectiveness Assessment. Prior to the workshop, the participants completed a Midway Program Evaluation Survey. The Midway Program Evaluation Survey was comprised of the same questions that had been asked in the Knowledge Assessment Survey (e.g., baseline survey) carried out prior to the program kick-off. The degree of change in the participant's responses to the survey questions, coupled with trainer observation and quiz/course completion analytics, formed the basis to establishing program effectiveness at the current mid-point juncture.

1.6 DECISION GATES

The training program has two (2) **Decision Gates.** A decision gate is a point in the process, where the criteria related to the specific decision gate needs to be met in order to continue and/or modify the training program. The first decision gate (DG1) was endorsed on 25 March, 2022, following the conclusion of nominee candidate interviews and receipt of signed commitment letters from all selected participants.

The second decision gate (DG2) is at the end of Stage 2 when training Modules 1 and 2 are completed and the Midway Program Effectiveness Assessment has been concluded. Proceeding with subsequent training in Stage 3 of the program requires that the criteria for DG2 is satisfied. Both Module 1 and 2 Evaluation Reports will feed into a Midway Program Effectiveness Assessment workshop (W3). Conclusions from the workshop will be summarized in a memo which will constitute the basis for the Go/No Go decision by ADB. Subsequent to DG2, an assessment of individual and collective level of learning, changes to the subsequent training program, trainee line-up, and delivery mechanism will be discussed and agreed upon.

1.7 OBJECTIVE OF THE REPORT

This report presents the outcomes of the monitoring and evaluation activities of Module 2 of the Targeted Capacity Building Program, as well as preliminary reflections on observations made to date related to program effectiveness. Key inputs to the report are the continuous dialogue with the participants, the results of the two (2) quizzes which were included as part of the sub-modules 2b and 2c, and the holistic evaluation survey covering the different components of Module 2. Furthermore, this report summarizes key learnings and next steps.

Source: AASCTF/Kristine Lucero

2 MONITORING AND EVALUATION

Source: AASCTF/Kristine Lucero

2.1 COURSE EVALUATION

2.1.1 TRAINING FORMAT

The core of Module 2 was two self-paced courses, one on "Introduction to hydrological modelling (NAM) (Module 2b) and one on "MIKE HYDRO River – Getting started with river modelling" (Module 2c). Module 2a was instructor-led and served as an introduction to hydrological and hydraulic modelling, as well as an introduction to the two self-paced Module 2b & 2c courses. The instructor-led Module 2d course served as follow-up to the two self-paced courses, as well as fulfilment of knowledge gaps and resolution of any outstanding questions raised by the participants. The four (4) sub-modules are specified in Table 2.1 along with the date of conclusion for each session.

Module 2 was implemented in accordance with the originally prepared work plan shared with participants ahead of the program kick-off, with the only exception being that Module 2c was carried out prior to Module 2b.

Table 2.1 Summary of the sub-modules and sessions conducted in Module 2

Sub-module	Sessions	Date concluded
2a: Hydrological and hydraulic modelling (Instructor-led course)	S1: Introduction to hydrological modelling	03/05/2022
	S2: Introduction to hydraulic modelling	05/05/2022
2b: Introduction to hydrological modelling (NAM) (self-paced)	S1: Introduction to the self-paced course / Q&A Session 1	26/05/2022
	S2: Q&A session 2	31/05/2022
2c: MIKE HYDRO River – Getting started with river modelling (self-paced)	S1: Introduction to the self-paced course / Q&A Session 1	11/05/2022
	S2: Q&A session 2	17/05/2022
2d: Hydrological and hydraulic modelling (Instructor-led)	S1: Key requirement for hydrological modelling, including NAM calibration	06/06/2022
	S2: Expert advice for maintenance and operation of hydrological and hydraulic models in an operatoinal FEWS, including data assimilation	14/06/2022

The instructor-led sessions consisted of a combination of 1) Introductions to the specific subjects, 2) examples and demos of different NAM and MIKE HYDRO River models and model applications, 3) Group work in breakout rooms, and 4) presentations by participants, as illustrated in Table 2.2.

Table 2.2 Summary of the different teaching formats applied in the three sub-modules in Module 2.

Type of learning format	Module 2a	Module 2b	Module 2c	Module 2d
Introduction to the subjects (mainly PPT presentations)	X			X
Demo of Hydrological and hydraulic modelling tools	X	X	X	X
Group work in breakout rooms	X			
Presentations by participants	X			
Q/A sessions		X	X	X
Self-paced course		X	X	

2.1.2 ACTIVE PARTICIPATION

All ten (10) participants participated in all of the instructor-led sessions (Module 2a & Module 2d) except from session 1 of Module 2a, where four participants were absent due to other commitments. While there was a slow start on both of the self-paced courses, due to many other activities that the participants are engaged in, all the participants succeeded to eventually complete in full both of the self-paced courses (Modules 2b & 2c). Furthermore, there has also been 100% participation in the two quizzes associated with each of the self-paced courses. To ensure proper planning and blocking of requisite time within their work week to accommodate the trainings, the participants were provided with confirmed dates and times, including issuance of Zoom invitations, well in advance. Furthermore, all instructor-led sessions have been scheduled from 15.00-17.00 PHST, allowing participants to plan for- and prioritize the training sessions.

Module 2b & 2c self-paced courses provided the opportunity for participants to get hands-on experience with both the NAM model and MIKE HYDRO River which are the key model components in the FEWS. As all the training material will remain in the longer-term on the eLearning Platform, participants also have the opportunity to go back and redo the exercises in order to gain more familiarity and confidence in using and understanding the models. The self-paced courses aim at facilitating peer-to-peer learning as they provide an opportunity for the participants to collaborate on exercises and learn from one another.

As the focus of Module 2 was really on the self-paced courses, there was consequently less interaction between the instructors and the participants as compared to that of Module 1.

2.1.3 PARTICIPANT FEEDBACK

In addition to the continuous feedback dialogue with the participants during the sessions, the participants were also asked to fill out an evaluation survey following the completion of Module 2 which covered questions related to all the four Module 2 sub-modules. The results of the evaluation survey are shown in Table 2.3.

Table 2.3 Summary of the course evaluation of Module 2. The possible scores: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly agree.

No	Question	Average score
1	The technical content of the instructor-led courses (2a & 2d) was satisfactory	4.60
2	The instructors in the instructor-led courses (2a & 2d) were well-qualified, and their technical knowledge was adequate.	4.80
3	The presentations in the instructor-led modules covered the subject well and supplemented the self-paced courses by providing introduction and follow-up to the self-paced courses	4.60
4	The technical content of the NAM modelling self-paced course (2c) was satisfactory	4.50
5	The NAM modelling self-paced course (2b) provided a good introduction to the basic skills required to do hydrological modelling with the NAM model	4.60
6	The technical content of the MIKE HYDRO River modelling self-paced course (2c) was satisfactory	4.60
7	The MIKE HYDRO River modelling self-paced course (2c) provided a good introduction to the basic skills required to use the MIKE HYDRO River model.	4.50
8	The self-paced courses complemented the on-the-job training well, as they provided the basic terminology and understanding of the models before we started the on-the-job training	4.60
9	It worked better with the short videos (3-8 minutes long) in Modules 2b & 2c, as compared to the longer videos in the self-paced course in Module 1c	4.40
10	The eLearning Platform is very suitable for this type of online training course as all the material we have gone through are there, and if we have forgotten or not properly understood some of the required technical skills in e.g. the NAM and MIKE HYDRO River models, we can review the videos to refresh our knowledge	4.70
11	I will be able to use and apply the knowledge and skills I have acquired during Module 2 in my future professional activities	4.60
12	I would recommend my colleagues to participate in the Capacity Building Programme	4.60

As evident from Table 2.3, the Module 2 feedback from the participants has been very positive as the score for all the answered questions is between 4 and 5, indicating that the participants either agree or strongly agree to the statements. In fact, the score is even, i.e., between 4.5 and 5, for 11 out of the 12 questions. The highest score is 4.80 which is for "The instructors in the instructor-led courses (2a & 2d) were well-qualified, and their technical skill was adequate". During interactions with the participants, some of them stated that they found it difficult to get started with the self-paced courses. The participants also mentioned that they have been collaborating and interacting in groups of 2-3 during the exercises, which is a very positive signal. While the IT professionals in the group do not have the same experience in relation to hydrology and flooding as many of the other participants, they could help the other participants with some of the more IT technical aspects of the self-paced courses, which the other participants acknowledged they appreciated. Also, many participants expressed that the self-paced courses complemented the OTJ training very well, as the courses had given them a good basic understanding of the models helping them to benefit more from the OTJ training.

In the evaluation of Module 1, the participants expressed that the videos for the self-paced course Module 1c were too long. This feedback was considered in the preparation of the self-paced courses Module 2b and Module 2c which comprised significantly shorter videos. As evident from Table 2.3, the feedback on the shorter videos is good with all participants either agreeing or strongly agreeing that the shorter videos are better.

In the evaluation survey the participants were also asked for suggestions on improvement of the self-paced courses. Most of them responded that they did not have any suggestions, indicating that they have been happy with the courses, as also reflected in Table 2.3. However, there were a few suggestions and comments. One suggestion was to a prepare a page with definition of terms, which will indeed be made available on the e-Learning platform prior to the start of Module 3 post-monsoon. A few participants also mentioned that they would like to have more hands-on exercises, which will be achieved through the post-monsoon OTJ training and will be considered in the preparation of Module 3.

2.2 THE QUIZZES

The purpose of the quizzes is to find out how much the participants have learned during the modules. As already mentioned, a set of quizzes were included in both Module 2b and 2c. The results of the quizzes are shown in Table 2.4 and Table 2.5.

Table 2.4 Questions asked in the QUIZ for Module 2b and the respective percentage of correct answers. The correct answer(s) are marked with bold. For question 1 & 2 the figures in parenthesis indicate how the participants responded to these two same questions in module 1b.

No	Question	% Correct answers
1	Runoff from a catchment area may occur as different types of flow. Which of the following flow components are the fastest? 1) **Overland flow,** 2) Interflow or 3) Baseflow	**100%** (73%)
2	Which of the following terms do you associate with the hydrological cycle (note there may be more than one correct answer)? 1) **Overland flow,** 2) Climate change, 3) Infiltration, 4) Hydropower, 5) irrigation or 6) **Baseflow**	81% (63%)
3	How many storages are included in the NAM model? 1) 2, 2) 3 or 3) **4**	56%
4	Which type of time series ARE NEEDED if you want to RUN AND CALIBRATE a NAM model in areas with no snow? 1) Precipitation & Potential Evapotranspiration, 2) Precipitation, Temperature & Potential Evapotranspiration, or 3) **Precipitation, Potential Evapotranspiration & Discharge**	67%
5	What does the NAM parameter Umax indicate? 1) The maximum storage in the root zone, 2) **The maximum storage in the surface storage**, or 3) The maximum overland flow in one day.	67%
6	Which module(s) in MIKE HYDRO River do you need to run the NAM model 1) Rainfall runoff & Hydrodynamic, 2) **Rainfall runoff**, 3) Hydrodynamic, or 4) Rainfall runoff & Data assimilation	44%
7	For which purpose are we using the Digital Elevation Model in our NAM setup? 1) T**o digitize the river(s) and delineate the catchment area**, 2) To have a background map, or 3) To read the elevations in our catchments	89%
8	What does the WBL statistical value in the plot composer tells us? 1) The total simulated runoff in millimetre, 2) **The relative difference (%) of the observed runoff as compared to the simulated runoff over the whole simulation period,** 3) The mean annual difference (mm) between the observed and the simulated runoff (Qobs-Qsim)	78%
9	Why did we start and ended the simulation during the dry part of the year? 1) That was just by change – it does not matter which time of the year you start and end the simulation, 2) **Because the water stored at the different storages are at the lowest this time of the year and very often of similar magnitude from year to year**	**100%**
10	Which of these parameters describe the root zone THRESHOLD value for overland flow? 1) CQOF, 2) **TOF**, 3) CK12, 4) TIF	44%

Table 2.5 Questions asked in the QUIZ for Module 2c and the respective percentage of correct answers. The correct answer(s) are marked with bold.

No	Question	% Correct answers
1	How can models be configured in MIKE HYDRO River? 1) By filling in all the information in a table, 2) **By using both a map-based environment and tabular views**, 3) By editing text files manually.	70%
2	What is the different way of configuring a model? 1) **From the map**, 2) In the simulation tab, 3) **In the property view**, 4) In the symbology tab, 5) **In the tabular view**	50%
3	Which of the following equations does MIKE HYDRO River solve? 1) Navier-Stokes equation, 2) **Saint-Venant equations**, or 3) Reynolds-averaged shallow water equations	80%
4	Choose the correct statements related to the generation of branches in MIKE HYDRO River. 1) **Branches can be extracted from a DEM**, 2) **Branches can be digitized on the map**, 3) Branches can be automatically derived from aerophotos, and/or 4) **Branches can be imported from shapefile**	80%
5	How many markers have to be defined for each cross sections? 1), 2) **3** or 3) 5	**100%**
6	Select the correct statement 1) Bed resistance can only be defined as a global for the entire model, 2) Bed resistance has to be defined for each branch manually, or 3) **A default bed resistance value can be defined, and local values applied to river stretches**	80%
7	Which type of rainfall runoff model is available in MIKE HYDRO River? 1) **Lumped,** 2) Semi-distributed, or 3) Distributed	**100%**
8	How can a rainfall runoff catchment be defined in MIKE HYDRO River? 1) It is not possible to define rainfall runoff catchments in MIKE HYDRO River, 2) It can only be done manually, or 3) **It can be defined manually or using a shapefile or a DEM**	**100%**
9	How can we apply the catchment runoff into the river model? 1) **As a point source along a branch (tributary),** 2) **As the upstream end of a branch,** 3) **Distributed along the river stretch,** and/or 4) **Distributed along an entire river branch**	58%
10	What is the purpose of validation? 1) Pre-processing parameters, 2) Run a few timesteps to check if the model is ready, or 3) **Checks if all required data are available for the model setup**	70%
11	Is it possible to run a model without a valid license, in DEMO mode? 1) No, it is not possible, 2) **Yes, it is possible but with some limitations,** or 3) Yes, it is possible without any limitations	90%
12	Can the name and the location of the result files be changed before the run? 1) No, it is not possible, 2) The name can be changed, but the location cannot, or 3) **Yes, both the name and location of the result files can be changed before the run**	**100%**
13	Select the valid statement(s) 1) Both the rainfall runoff and the hydrodynamic simulations must have the same timestep, 2) **The rainfall runoff's timestep is a multiplier of the HD timestep**, 3) Rainfall runoff results are saved in the same file as the HD results.	45%
14	Where can I see issues that occurred during the simulation? 1) **In the Error Log,** 2) In the Summary Log	89%
15	How many timeseries can be plotted in one plot in the result view of MIKE HYDRO River? 1) It is not possible to plot timeseries, 2) Only one time series in one plot, or 3) **As many timeseries as we want**	89%
16	Is it possible to visualize longitudinal profiles and cross-section animations? 1) No, it is not, 2) **Yes, it is, but only in MIKE View,** or 3) Yes, it is, in MIKE HYDRO River as well as in MIKE VIEW	44%
17	Is it possible to animate results? 1) No, it is not, 2) **Yes, it is, but only in MIKE View,** 3) Yes, it is, in MIKE HYDRO River as well as in MIKE View	89%

A few comments to the Quiz results.

1. Taking into consideration that none of the core group members have any background in hydrology, hydraulics or modelling and never have worked with the NAM or the MIKE HYDRO Basin model before, **it is very encouraging to see how high the correct response rate is for most of the questions.**
2. The first two questions in the QUIZ in Module 2b was also asked to the participants in Module 1b. This was done with the purpose of assessing whether their knowledge has improved. From the table we can see that the correct response rate has increased from 73% to 100% for Q1 and from 63% to 81% for Q2. This is a very positive improvement of their understanding.
3. When looking at the responses of the individual participants it is clear that those with a hydrological background (from the peer group) have a much better response rate than those who e.g., have an IT background. In fact, **one of the participants with a hydrological background had a 100% and 97% correct response rate for Module 2b and 2c, respectively.** This is very impressive taking into consideration that the person has never worked with neither the NAM nor the MIKE HYDRO River model before.
4. There are a few questions where the positive response rate is relatively low, in a few cases below 50%. However, inspired by the relatively high positive response rate in Module 1, it should be mentioned that some Module 2 questions were purposely made quite tricky in that there was little difference between the correct and the wrong answers. But apart from these few tricky questions the participants have scored generally quite well, often in the range of 80-100%, which is highly satisfactory taking into consideration that most of the participants do not have a background in hydrology, hydraulics, or modelling.

3 CONCLUDING REMARKS

Source: AASCTF/Kristine Lucero

The main observations and conclusions from Module 2 (and the program to date) are briefly summarized below:

1. The plan for delivery of Module 2, as outlined in the "Scoping and Training Course Design Report", has been followed.
2. There has been 100% participation in all the instructor-led sessions (apart from one), the self-paced courses, the evaluation survey and the quizzes.
3. The participant feedback on Module 2 was very positive as the score for all the answered questions is between 4.00 and 5.00 indicating that the participants either agree or strongly agree with statements related to e.g., the course content, format, and level being good.
4. There has been a good learning curve – not least taking into consideration that most of the participants had a very limited educational background within hydrology, river hydraulics and hydrological and hydraulic modelling and none or very limited knowledge about MIKEByDHI software prior to the start of the training. The percentage of correct answers in the quizzes has been higher than expected.
5. The discussions during the sessions have fostered a constructive dialogue between the participants and the instructor, and it has helped the project team to adapt to the specific need and wishes of the participants.
6. One (1) participant from the peer-group (from University of the Cordilleras) has left the program due to added responsibilities and changed schedules and requirements in their current projects. Hence, ten (10) trainees are currently participating in the program. The impact of this on the project sustainability is expected to be low as there is an additional participant from the same department in the university who has full endorsement to continue actively in the program and can ensure continuous future collaboration with the university.
7. The Targeted Capacity Building Program, including this 3-module training program and OTJ training, is crucially important for the sustainability of the FEWS project. However, given the starting point of the participants it will be a challenge to bring them to the necessary professional level through completion of training to enable them to be fully responsible for the operation and maintenance of the FEWS system once the project is completed. Therefore, the project team together with ADB has already identified that **there will be a need for a consolidation phase after the completion of the project in December 2022.** Further details on the specifics of this consolidation phase and the extent of AASCTF support will be ironed out in the coming period, concluding at or before the completion of the current work program in Baguio.

ABOUT THE ASEAN AUSTRALIA SMART CITIES TRUST FUND

The ASEAN Australia Smart Cities Trust Fund (AASCTF) assists ASEAN cities in enhancing their planning systems, service delivery, and financial management by developing and testing appropriate digital urban solutions and systems. By working with cities, AASCTF facilitates their transformation to become more livable, resilient, and inclusive, while in the process identifying scalable best and next practices to be replicated across cities in Asia and the Pacific.

ASEAN AUSTRALIA SMART CITIES TRUST FUND
Asian Development Bank

Australian Government
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ADB